

# Quality control of dextran

**Application**

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Dextran is widely used for different applications in pharmaceutical, cosmetics, paint, adhesive and paper industries. Their molecular weight can range from  $3 \times 10^4$  to  $3 \times 10^7$ . The properties strongly depend on the molecular weight, the molecular weight distribution and impurities. The chromatogram shows the analysis of a dextran used in cosmetic formulations.

The initial analysis with just one PL aquagel-OH mixed column already indicated the presence of impurities by showing a shoulder in the main product. By adding the PL aquagel-OH 30 column the resolution could be increased further, thus clearly proving the impurity. Using the ChemStation GPC data analysis software not only the molecular weight averages and the molecular

## Conditions

### Sample preparation

Sample was dissolved in the mobile phase (concentration 0.1 %) and filtered

### Column

PL aquagel-OH Mixed,  $7.5 \times 300$  mm,  $8 \mu\text{m}$  (Agilent p/n 79911GF-MXA) in series with PL aquagel-OH 30,  $7.5 \times 300$  mm,  $8 \mu\text{m}$  (Agilent p/n 79911GF-083)

### Mobile phase

water

### Flow rate

1 mL/min

### Column compartment temperature

25 °C

### Injection volume

100  $\mu\text{l}$

### Detector

Refractive index detector

### Polymer standards

Polyethylene oxide EasyCal standards in vials for calibration (Agilent p/n 5064-8280)

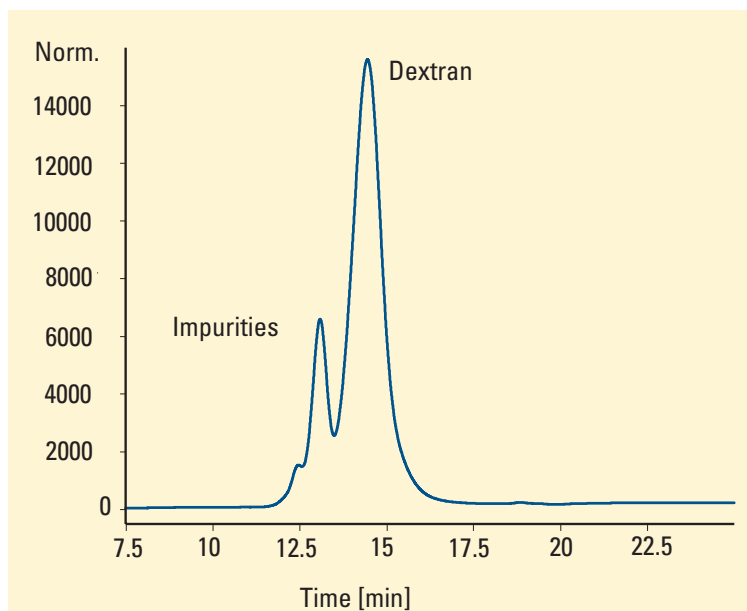


Figure 1  
Analysis of dextran sample



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weight distributions can be calculated, but also additional rapid numeric data is provided in the form of the user-defined report subsets. Figure 2 shows a typical GPC report containing information on the sample and the method used, the molecular weight distribution and the molecular weight results. Three subsets in form of weight fractions at the user-defined molecular weights 10000, 280000 and 780000 are reported:

Subset 1: for molecular weights up to 10000 dalton: 0.16 % contribution to the polymer

Subset 2: for molecular weights up to 280000 dalton: 80.76% contribution to the polymer

Subset 3: for molecular weights up to 780000 dalton: 100% contribution to the polymer

The contribution of the impurity peak with molecular weights from 280000 to 780000 dalton is 19.1 %. Report subsets can be also specified for determination of molar masses at given values of the cumulative distribution.

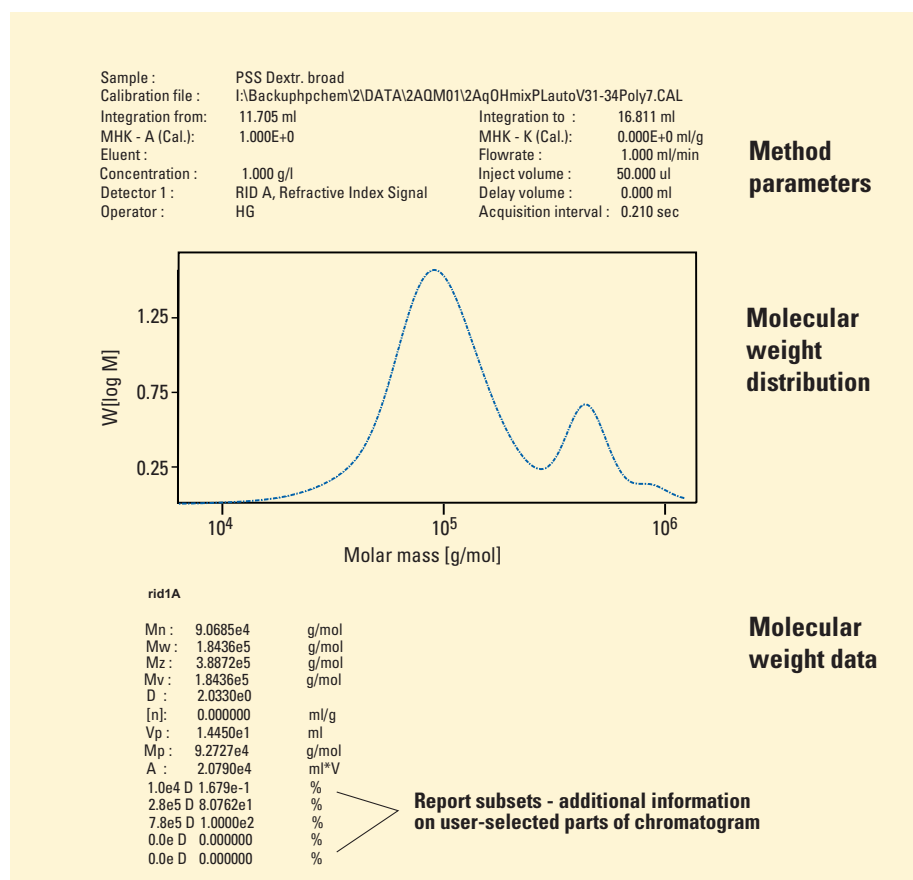


Figure 2  
Typical GPC report

## HPLC performance

RSD of $M_w$	< 1.5%
RSD of $M_n$	< 5%

## Equipment

### Agilent 1100 Series GPC-SEC system

consisting of

- vacuum degasser for efficient degassing of the mobile phase
- isocratic pump with large solvent cabinet
- autosampler with single valve design
- thermostatted column compartment for precise column temperatures
- refractive index detector with automatic recycle valve
- ChemStation Plus with GPC-SEC data analysis software

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